REMARKS

This Amendment is in response to the Office Action dated June 29, 2009 (the Action).

I. Status of the Claims

Claims 29, 30, 34-40, 46-48, 50, 53, 58 and 59 are withdrawn as being directed to a nonelected species. Claims 55 and 56 stand rejected under 35 U.S.C. 112, second paragraph. Claims 26-28, 43, 49 and 51 stand rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 6,179,793 to Rothman ("Rothman"). Claims 31-33, 44, 45, 52 and 54-57 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Rothman in view of U.S. Patent No. 6,390,996 to Halperin et al. ("Halperin"). In response, Claim 26 has been amended to clarify that the compression avoids the vulnerable portion of the intrinsic cardiac cycle. Support for this recitation can be found, for example, in original Claims 43, 44 and 49 and in Applicants' specification, page 6, line 32 – page 7, line 3.

Reconsideration is respectfully requested in view of the amendments below and the remarks that follow.

II. The 35 U.S.C. 112 Rejections

Claims 55 and 56 have been amended above to correctly depend from Claim 43. Claim 55 has been amended to delete the term "means for electronically identifying" to address the antecedent basis issue noted in the Action on page 2.

Accordingly, Applicants request that the rejections under 35 U.S.C. 112 be withdrawn.

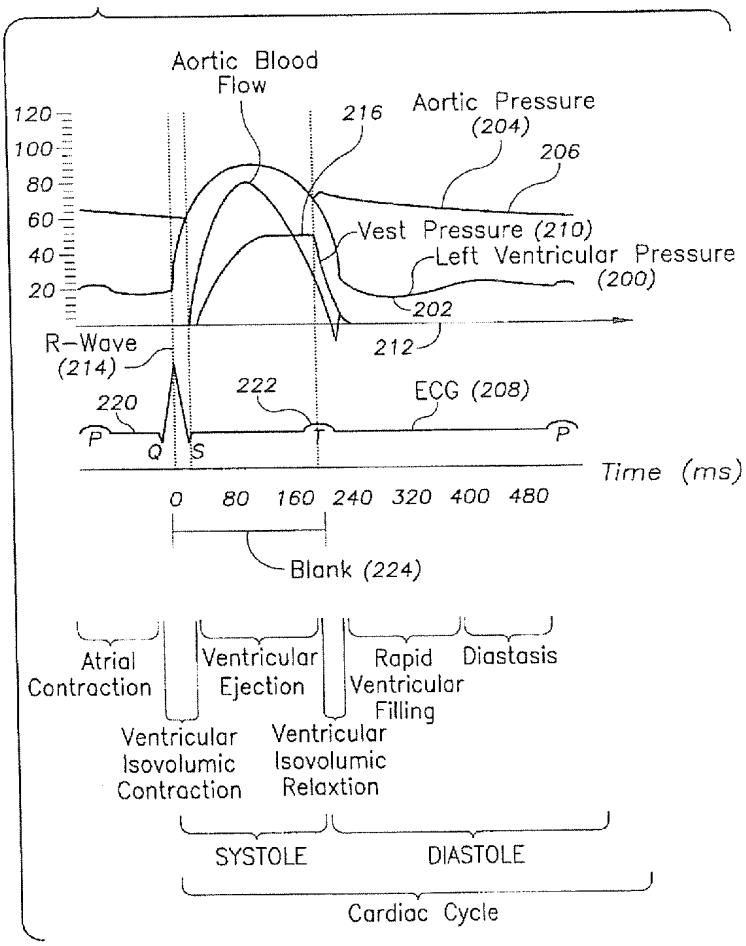
III. The 35 U.S.C. 102/103 Rejections

The Action takes the position that Rothman discloses a system and method for assisting in chest compression in a subject having cardiomalfunction that includes a controller 322 that is configured to apply a "blanking time" to avoid delivery of a chest compression during the T-wave portion of the spontaneous intrinsic cycle at column 16, lines 5-25. *See* the Action, page 3. As discussed in Applicants' specification, the vulnerable portion of the

spontaneous intrinsic cardiac cycle includes the T-wave portion of the cycle. *See* Applicants' specification, page 6, line 23 - page 7, line 3.

Applicants cannot locate any portion of Rothman that discusses vulnerable portions of the cardiac cycle. As best understood by Applicants, the Action is taking the position that the "blanking time" in Rothman somehow avoids the vulnerable portion of the cardiac cycle, and the Action concludes that the device in Rothman meets the recitations of the claims. However, timing the compressions according to the "blanking time" in Rothman does not avoid delivery of the chest compression during the T-wave portion as maintained in the Action. *See* the Action, page 3. In sharp contrast and as clearly shown in Figure 2 of Rothman (reproduced below), the chest compressions in Rothman overlap the T-wave.

FIG. 2



Rothman states that optimum system operation is achieved with vest inflation that corresponds "exactly" to heart systole so that the vest inflation does not last more than one-half (50%) of the heart cycle. *See* Rothman, col. 15, lines 46-49 and 62-65. The portion of Rothman cited in the Action merely discusses that the vest can trigger on the R-wave and should not trigger on electric noise, premature heartbeats, elevated T-wave or other ECG components that follow the QRS complex. *See* Rothman, col. 16, lines 5-10. The blanking time is set so that the controller ignores all spikes for some period (*e.g.*, 200 mn after the last triggering event), and so that the vest is not triggered prematurely before the next R-wave. If the vest were triggered prematurely before the next R-wave, Rothman discusses that it might compress the chest during heart diastole and prevent venous blood from returning to the heart. Thus, Rothman suggests that the blanking time be set to 50% of the total cardiac cycle to avoid such premature triggers. *See* Rothman, col. 16, lines 5-50 (cited in the Action).

When the compressions of the device in Rothman are triggered on the R-wave as shown in Figure 2 of Rothman, a portion of the compression clearly occurs *during* the T-wave, which Applicants' specification identifies as the vulnerable portion of the spontaneous intrinsic cardiac cycle. *See, e.g.*, Applicants' specification, page 6, line 23 – page 7, line 3. Therefore, Rothman's discussion of avoiding a compression trigger on the T-wave will not avoid a compression during the T-wave as maintained in the Action on page 3. In addition, Rothman makes no mention of avoiding vulnerable portions of the cardiac cycle. Thus, Rothman does not disclose compressing the heart of a subject during the non-vulnerable portion of the spontaneous cardiac cycle to avoid the vulnerable portion of the cardiac cycle as generally recited in the independent claims.

In summary, the techniques discussed in Rothman trigger a compression on the R-wave such that the compression extends through at least a portion of the T-wave (*see* Figure 2). Accordingly, Rothman does not disclose or render obvious at least the portions of the independent claims emphasized below.

> 26. A method for performing chest compression during cardiopulmonary resuscitation (CPR), comprising;
>
> sensing a parameter corresponding to a measure of intrinsic spontaneous cardiac activity of a heart in *a subject undergoing CPR*;
>
> identifying a vulnerable portion of an intrinsic spontaneous cardiac

cycle of the subject; and

compressing the heart of the subject *during a non-vulnerable portion of the spontaneous intrinsic cardiac cycle* that *avoids a vulnerable period* of the spontaneous intrinsic cardiac cycle based on the identifying step thereby inhibiting reinduction of fibrillation and/or improving cardiac function.

43. A system for assisting in chest compression in a subject having cardiomalfunction, comprising:

at least one cardiac activity sensor in communication with the heart of a subject configured to detect a cardiac activity parameter; and

a controller in communication with the at least one cardiac activity sensor, wherein, in operation, the at least one cardiac activity sensor transmits data to the controller regarding a spontaneous intrinsic cardiac cycle of the subject and the controller identifies a favorable time to deliver a chest compression based on the transmitted sensor data to avoid a vulnerable portion of the spontaneous intrinsic cardiac cycle, wherein the controller identifies *a time that does not overlap with the T wave portion* of the spontaneous intrinsic cardiac cycle.

44. A system for assisting in chest compression in a subject having cardiomalfunction, comprising:

at least one cardiac activity sensor in communication with the heart of a subject configured to detect a cardiac activity parameter; and

a controller in communication with the at least one cardiac activity sensor, wherein, in operation, the at least one cardiac activity sensor transmits data to the controller regarding a spontaneous intrinsic cardiac cycle of the subject and the controller identifies a favorable time to deliver a chest compression based on the transmitted sensor data *to avoid a vulnerable portion of the spontaneous intrinsic cardiac cycle*, further comprising an audible alert in communication with the controller, the controller configured to output an audible alert signal responsive to an identified favorable time to deliver a chest compression to the subject based on the transmitted sensor data.

49. A computer program product for timing the delivery of cardiac compression during CPR, the computer program product comprising:

a computer readable storage medium having computer readable program code embodied in said medium, said computer-readable program code comprising:

computer readable program code that identifies a vulnerable portion of an intrinsic spontaneous cardiac cycle of the subject; and

computer readable program code that determines a favorable time to deliver cardiac compression to a subject to avoid a vulnerable period of the spontaneous intrinsic cardiac cycle.

The missing elements of the independent claims emphasized above are also not disclosed in Halperin, which is cited with respect to Claims 31-33, 44, 45, 52 and 54-57.

For at least the reasons discussed above, Applicants submit that Rothman and Halperin do not disclose or render obvious the recitations of independent Claims 26, 43, 44 and 49. Claims 27-28, 31-33, 45, 51, 52 and 54-57 are patentable at least per the patentability of the claims from which they depend. Accordingly, Applicants request that the rejections under 35 U.S.C. 103(a) be withdrawn.

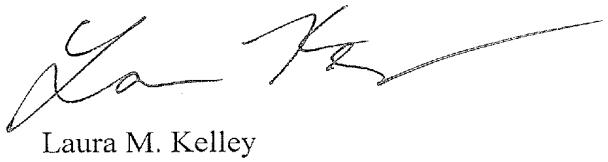
IV. Withdrawn Claims 29, 30, 34-40, 46-48, 50, 53, 58 and 59

Claims 29, 30, 34-40, 46-48, 50, 53, 58 and 59 depend from independent Claims 26, 43, 44 and 49, which Applicants submit are in condition for allowance for at least the reasons discussed above. Accordingly, Applicants request that Claims 29, 30, 34-40, 46-48, 50, 53, 58 and 59 be rejoined and considered in the application due to the allowability of the claims from which they depend.

CONCLUSION

Accordingly, Applicants submit that the present application is in condition for allowance and the same is earnestly solicited. Should the Examiner have any matters outstanding of resolution, he is encouraged to telephone the undersigned at 919-854-1400 for expeditious handling.

Respectfully submitted,



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Attachments

CERTIFICATION OF TRANSMISSION

I hereby certify that this correspondence is being transmitted via the Office electronic filing system in accordance with § 1.6(a)(4) to the U.S. Patent and Trademark Office on September 28, 2009.

Signature: Joyce Paoli
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